



## EXAMPLE - CREEKVIEW MITIGATION BANK

The following stepwise example uses the bank credit formula described in Section 5. Some portions of the narrative descriptions of the existing conditions, mitigation plan and WRAP analysis are simplified in order to keep the example brief. Actual submittals to the MBRT for a bank should contain sufficient detail to support the proposal.

### CREEKVIEW MITIGATION BANK

#### Existing conditions of the bank site.

Please refer to the diagram at the end of this section labeled "Existing Condition". The bank property covers a total area of approximately 340 acres composed of the following cover classifications.

| Upland/Wetland Number | Acreage   | Habitat Type                  |
|-----------------------|-----------|-------------------------------|
| W1                    | 90 acres  | Freshwater Forested Wetland   |
| W2                    | 23 acres  | Freshwater Forested Wetland   |
| W3                    | 12 acres  | Freshwater Herbaceous Wetland |
| W4                    | 10 acres  | Freshwater Forested Wetland   |
| W5                    | 40 acres  | Freshwater Forested Wetland   |
| U1                    | 140 acres | Upland Forest                 |
| U2                    | 25 acres  | Upland Pasture                |

The bank site is located adjacent to Crippled Creek and is bordered by the Crippled Creek Wildlife Refuge (CCWR) and the Creekview residential subdivision. Historically, the tract was upland flatwoods interspersed with depressional forested wetlands and depressional herbaceous wetlands. The forested wetland W3 and herbaceous wetland W4 were ditched in the 1930's resulting in reduced hydroperiods. Over time, the areal extent of both of these wetlands was also reduced. The vegetative composition of the canopy surrounding the western perimeter of W3 shifted from wetland species to upland species with the encroachment of some invasive exotic species. Upland area U2 was converted from flatwoods to improved pasture. Forested wetland W5 was partially filled in the 1950's when the Creekview subdivision was initially developed. The portion of the Crippled Creek floodplain W1 adjacent to the improved pasture suffered secondary impacts due to the conversion. Forested wetland W2 was not directly impacted and is relatively undisturbed by secondary impacts.

## **The Mitigation Plan**

The banker proposes to restore the hydroperiod of the ditched wetlands W3 and W4 by completely backfilling the ditch. Once the hydroperiod is restored, the extent of these wetlands is expected to expand approximately 10% to their original sizes (W3 expands to 13.2 acres representing a 1.2 acre increase and W4 expands to 11 acres representing a 1 acre increase). The canopy of the existing upland forest surrounding the western perimeter of W3 is expected to shift back to a wetland composition and planting is not proposed. The area surrounding the eastern perimeter of W3 that expands into the current pasture will be planted with a natural mix of hardwood species to accelerate revegetation. The area of existing pasture surrounding W4 that becomes wetland again is expected to revegetate with herbaceous wetland species. The existing pasture grasses in the revegetation area will be removed to reduce competition. The remaining area of U2 is to be rehabilitated to a flatwoods community through the planting of pines, palmetto and wiregrass. As is the requirement of all mitigation banks, the Banker will encumber the tract with a conservation easement. A long term management plan is proposed that includes the maintenance of the natural fire regime. Financial assurances will be provided (construction bonding and long-term management trust fund). Long-term management will be assumed by the CCWR upon complete debit of the bank.

### **Stepwise application of the Joint State/Federal Mitigation Bank Crediting Procedure.**

**Step 1** Describe the existing conditions and the with- and without-bank scenarios: (note: in order to reduce the complexity of this example, descriptions have been kept brief. The descriptions provided by Bankers in actual submittals will be expected to adequately support the various scenarios upon which credits will be based.) The existing conditions were described previously. Please refer to the diagrams at the end of this section labeled "With Bank" and "Without Bank". The with-bank scenario is essentially the conditions described in the mitigation plan. Consideration of the without-bank scenario allows for quantification of the preservation value of the bank. Therefore, the determination of an appropriate without-bank scenario should be based on a demonstrable threat of aquatic function degradation due to human activities that might not otherwise be expected to be restricted. The existence of a demonstrable threat will be based on clear evidence of destructive land use changes which are consistent with local and regional land use trends and are not the consequence of actions under the control of the bank sponsor. In the without-bank scenario for this example, the site is developed as "Creekview Phase II". This would involve "squaring off" of a few of the residential lots in wetlands W3 and W4. This is a reasonable without-bank scenario because the area is experiencing rapid population growth, "Creekview Phase II" is already platted and is consistent with the County's comprehensive plan.

**Step 2** Delineate with-bank wetland polygons: Please refer to the diagram at the end of this section labeled "Polygon Delineation". The complexity of this step in the exercise will depend upon the complexity of the landscape of the bank site, the with- and without-bank

scenarios and the mitigation plan. In this example, nine wetland polygons have been delineated on the bank site. The reasoning for the polygon breakout follows:

Polygon A1 (1.0 acre)

- Existing condition is upland pasture.
- Without-bank condition is residential lots.
- With-bank condition is herbaceous wetland restored from the existing pasture.

Polygon A2 (10.0 acres)

- Existing condition is herbaceous wetland with a reduced hydroperiod due to ditching.
- In the without-bank condition the wetland receives small direct impacts from filling for roads and lots. Secondary impacts are expected due to the shift in adjacent land use from pasture to residential.
- In the with-bank condition the hydroperiod is restored within the wetland itself and secondary benefits are expected from the shift of the adjacent land use from pasture to reforested upland.

Polygon A3 (4.0 acres)

- Existing condition is upland pasture.
- Without-bank condition is residential lots.
- With-bank condition is reforested wetland restored from the existing pasture.

Polygon A4 (8.0 acres)

- Existing condition is upland forest.
- Without-bank condition is residential lots.
- In the with-bank condition the vegetative composition shifts from upland to wetland forest.

Polygon A5 (12.0 acres)

- Existing condition is forested wetland with a reduced hydroperiod due to ditching.
- In the without-bank condition the wetland receives small direct impacts from filling for roads and lots. Secondary impacts are expected due to the shift in adjacent land use from pasture to residential.
- In the with-bank condition the hydroperiod is restored within the wetland itself and secondary benefits are expected from the shift of the adjacent land use from pasture to forested upland.

Polygon A6 (23.0 acres)

- Existing condition is undisturbed forested wetland.
- In the without-bank condition the wetland receives secondary impacts due to the shift in adjacent land use from undisturbed upland forest to residential.
- In the with-bank condition the expected secondary impacts due to the shift in adjacent land use are prevented.

**Polygon A7 (40.0 acres)**

- Existing condition is moderately disturbed forested wetland.
- In the without-bank condition the wetland is indirectly impacted due to the shift in adjacent land use from undisturbed upland forest to residential.
- In the with-bank condition the expected secondary impacts due to the shift in adjacent land use are prevented.

**Polygon A8 (55.0 acres)**

- Existing condition is undisturbed forested floodplain wetland.
- In the without-bank condition this wetland receives secondary impacts due to the shift in adjacent land use from undisturbed upland forest to residential.
- In the with-bank condition the expected secondary impacts due to the shift in adjacent land use are prevented.

**Polygon A9 (25.0 acres)**

- Existing condition is slightly forested floodplain.
- In the without-bank condition this wetland receives secondary impacts due to the shift in adjacent land use from upland pasture to residential.
- In the with-bank condition secondary benefits are expected from the shift of the adjacent land use from pasture to forested upland.

Please note that the delineation of Polygons A8 and A9 does not include the wetland area on the north side of the creek. Although this section of the wetland is located within the bank property and will be preserved, it is not expected to receive the above described secondary benefits. Determining where this cut-off should fall will depend upon topographic or vegetative breaks in the landscape and/or which function is most sensitive to change in the functional assessment used to generate the delta for the polygon.

(Note: For the sake of brevity, the direct impacts from the footprint of the ditch/berm have been ignored. This area could have been factored in as a separate polygon).

**Step 3** Determine the wetland function weighting factors for each variable at the polygon level, if appropriate.

Assign the weighting factors for each of the wetland functions. The "default setting" is to assume each of the WRAP functions is equally important. In most situations however, the relative weighting of each function may be adjusted in light of public interest considerations. For Polygon A2 the following were considered in adjusting the weights:

**Established Watershed Issues** - Refer to the Crippled Creek Ecosystem Management Plan. (Note: this is a fictitious plan that is not included in the example)  
The stated goals and objectives of the plan are:

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Increase the total spatial extent of natural areas.  
Improve habitat and functional quality  
Improve native plant and animal species abundance and diversity with special emphasis on threatened and/or endangered species.  
Increase availability of freshwater for agricultural /municipal/industrial purposes  
Reduce flood damages (agricultural/urban)  
Provide recreational opportunities.  
Protect cultural and archaeological resources and values.

One of the more specific actions identified in the plan is to establish buffer zones around the Crippled Creek Wildlife Preserve. This action item was included to address the goals of increasing the total spatial extent of natural areas, improving habitat and its functional quality, and improving native plant and animal species abundance and diversity. Also refer to Closing the Gaps in Floridas Wildlife Habitat Conservation System.

**Benefits To Important Adjacent Lands** - Establishment of the bank is expected to provide ecological benefit to the CCWP. The establishment of the bank would provide a buffer between the CCWP and the Creekview subdivision. The proposed long-term management plan for the bank is being developed in concert with the management practices of the CCWP. The effective increase in spatial extent of the CCWP will allow for more effective management.

**Threatened and Endangered Species** - Currently there is an active bald eagle nest on the CCWP. There is MBRT consensus that enhancement of the herbaceous wetland will provide an additional feeding site for the eagles.

**Scarce Habitats** : There are no habitats considered to be unusual, unique or rare in the region.

Refer to Section 5b for more detail regarding scoring calculations and descriptions.

#### WILDLIFE UTILIZATION (WU)

Established Watershed Issues (WI)=3. The Crippled Creek Management Plan contains elements to increase wildlife habitat.

Benefits to Important Adjacent Areas (AA)=3. Wildlife at the Crippled Creek Wildlife Refuge (CCWR) will benefit from the additional buffer/habitat created by the polygon.

Threatened or Endangered Species (T&E)=1. The polygon may attract (not increase population of) nearby nesting eagles by providing foraging habitat.

Scarce Habitats (SH)=0.

Special Considerations (SC)=0

## VEGETATIVE OVERSTORY (VO)

Not Applicable: Currently the polygon is herbaceous and will remain herbaceous.

## VEGETATIVE GROUNDCOVER (VG)

WI, AA, T&E, SH, and SC=0

## ADJACENT BUFFERS (UPLANDS)(AB)

WI=3. The CCWR's management plan identifies the buffering of wetlands as necessary for wildlife utilization.

AA=0

T&E=1. Buffered wetlands are more likely to be used by eagles.

SH=0

SC=0

## HYDROLOGY (HY)

WI=3. Increasing water storage capacity in isolated wetlands is identified as critical in the watershed management plan.

AA=3. Restoring hydrology will increase base flows to Crippled Creek.

T&E=1. Restored hydrology will increase the forage base for the eagle and woodstork.

SH=0

SC=0

## WATER QUALITY (WQ)

WI=0. Water quality was not identified as a critical element in the watershed management plan.

AA=3. Backfilling the ditches will prevent direct discharge into the Crippled Creek.

T&E=0

SH=0

SC=0

**Step 4 Run WRAP:** For each of the wetland polygons, run the assessment for the existing conditions and the with- and without-bank scenarios. For the sake of brevity, only the scoring for polygon A2 is described below. A similar process should apply to the remaining polygons.

**WRAP scoring for Polygon A2**

a. Wildlife Utilization Variable (Section 2.2.1.2 of WRAP) -

- 1) Existing condition - There is evidence the wetland is utilized by small and medium-sized mammals and some aquatic macroinvertebrates and amphibians. There is also adequate protective cover for wildlife. The above descriptors fit the score of 2.0. However, the wetland is located within the pasture and is subject to human disturbances from the cattle operation. The wetland is also not contiguous to naturally-occurring vegetative communities. These descriptors best fit the score of 1.0. Therefore, assign a score of 1.5.
- 2) Without-bank condition - When considering the wetland itself, A2 still fits the calibration descriptions for the score of 2. The vegetative structure is still intact in the existing condition and, for the most part, will remain intact in the without-bank condition. However, when considering the expected increase in adverse secondary impacts due to the shift in adjacent land use from pasture to residential, A2 best fits the calibration descriptions for the score of 1.
- 3) With-bank condition - The hydroperiod of the wetland itself is immediately restored by backfilling the ditch. This should substantially improve habitat conditions for aquatic macroinvertebrates and amphibians and also allow for the return of small forage fishes. This fits with the 3.0 descriptor for macroinvertebrates, amphibians and forage fishes. In the near-term, however, the rest of the calibration descriptors fit better with a score of 2.0. On the other hand, once the adjacent reforested upland reaches maturity, most all the calibration descriptions will better fit the score of 3.0. However, due to the close proximity of Polygon A2 to the Creekview subdivision, the potential for human disturbances is not negligible and proper long-term management through fire will be hampered. Therefore, when considering with-bank scenario in the long-term, Polygon A2 fits best between the scores of 3.0 and 2.0. Therefore, go ahead and assign a score of 2.5 for Wildlife Utilization because the final score will be adjusted in step 4 to account for the temporal lag and risk associated with the rehabilitation of the adjacent forested system.



b. Vegetative Overstory/Shrub Canopy Variable (Section 2.2.2.2, WRAP)

1) Since this is a herbaceous wetland, the overstory and shrub component is not scored, therefore, not applicable.

c. Wetland Vegetative Ground Cover Variable (Section 2.2.3.2, WRAP)

1) Existing condition: Ground cover is primarily appropriate native species but there is encroachment of inappropriate species and exotics. There are periodic impacts due to cattle grazing in from the adjacent pasture. Assign a score of 1.5.

2) Without-bank conditions fit closely with the Existing condition score but the shift in adjacent land use from pasture to residential is likely to result in greater disturbance and an increase in nuisance or inappropriate species. Assign a score of 1.0.

3) With-bank conditions: Most of the calibration descriptions fit the score of 3.0. However, due to close proximity to the Creekview subdivision, proper long-term management through fire will be hampered. Assign a score of 2.5.

d. Adjacent Upland/Wetland Buffer Variable (Section 2.2.4.2 WRAP)

1) Existing conditions: The polygon is surrounded by upland pasture. The buffer is greater than 300 feet and is dominated by invasive exotic plant species. A score, therefore of 1.0

2) Without-bank conditions: Residential housing up to the wetland line, therefore, a score of 0.

3) With-bank conditions: Surrounding upland pasture will be restored to herbaceous wetland (polygon A1) and forested upland, with a greater than 300-foot buffer on three sides. A small portion of the east side of the wetland is close to an existing residential subdivision. A score of 2.5 is appropriate.

e. Field Indicators of Wetland Hydrology Variable (Section 2.2.5.2 WRAP)

1) Existing condition: Even with the ditch, the hydrologic regime is adequate to maintain a viable wetland system. However, plants are showing signs of stress and there is evidence of soil subsidence. Assign a score of 1.5.

2) Without-bank condition: The shift in adjacent land use from pasture to residential is expected to result in alterations of the contributing watershed. When considering these secondary impacts and ditched condition of the wetland, A2 best fits the calibration descriptions for the score of 1.

3) With-bank condition: The wetland hydroperiod is restored by backfilling the ditch and the contributing watershed is maintained. This fits best with most of the calibration descriptions for the score of 3.0.

f. Water Quality Inputs and Treatment Variable (Section 2.2.6.2 WRAP)

1) Existing condition:

Landuse Category (LU): The adjacent land use is rangeland. Assign a score of 2.5.  
(Note: If Polygon A2 had more than one type of land use in its contributing watershed, the score would be assigned based on the relative contribution of each land use type. The formula for this type of situation is specified in the WRAP procedure).

Treatment Category (PT): There is no treatment of the runoff from the pasture so the score is 0.

The combined score for Water Quality Inputs and Treatment Parameter is  
 $(2.5+0.0)/2=1.25$

2) Without-bank condition:

Landuse Category (LU) . The adjacent land use will be single-family residential. Assign a score of 1.5.

Treatment Category (PT). The residential subdivision would need an adequate treatment system. Assign a score of 2.5.

The combined score for Water Quality Inputs and Treatment Parameter is  
 $(1.5+2.5)/2=2.0$

3) With-bank condition:

Landuse Category (LU). The score for the adjacent land use best fits with recreational/open space. Assign a score of 3.0.

Treatment Category (PT). The natural undeveloped area category best fits the forested condition expected in the with-bank scenario. Assign a score of 3.0.

The combined score for Water Quality Inputs and Treatment Parameter is  
 $(3.0+3.0)/2=3.0$

**Step 5** Determine the temporal lag factor: Please refer to section 5c.

In this example, polygon A2 is a herbaceous restoration effort; therefore, no temporal factor is required as the site will be restored within the 5-year credit release schedule. If the site was being restored as a forested system, a temporal lag factor would have been necessary due to the time required for the system to reach functional maturity.

**Step 6** Run the calculations to get the total of potential credits for polygon A2.

POLYGON NO: A2 \_\_\_\_\_  
 FLUCS CODE \_\_\_\_\_

|                                 |        |              |             |                |                  |                  |        |                |                |
|---------------------------------|--------|--------------|-------------|----------------|------------------|------------------|--------|----------------|----------------|
| POLYGON<br>ACREAGE              | 10     |              |             |                |                  |                  |        |                |                |
| VARIABLE                        | WEIGHT | EXIST<br>(A) | WITH<br>(B) | WITHOUT<br>(C) | DELTA<br>(A - C) | DELTA<br>(B - C) | TEMP   | ADJ<br>(A - C) | ADJ<br>(B - C) |
| WU                              | 0.268  | 1.500        | 2.500       | 1.000          | 0.167            | 0.500            | 1.0000 | 0.045          | 0.134          |
| VO                              | NA     | NA           | NA          | NA             | 0.000            | 0.000            | NA     | 0.000          | 0.000          |
| VG                              | 0.100  | 1.500        | 2.500       | 1.000          | 0.167            | 0.500            | 1.0000 | 0.017          | 0.050          |
| AB                              | 0.196  | 1.000        | 2.500       | 0.000          | 0.333            | 0.833            | 1.0000 | 0.065          | 0.163          |
| HY                              | 0.286  | 1.500        | 3.000       | 1.000          | 0.167            | 0.667            | 1.0000 | 0.048          | 0.191          |
| WQ                              | 0.172  | 1.250        | 3.000       | 2.000          | -0.250           | 0.333            | 1.0000 | -0.043         | 0.057          |
| <b>SUM</b>                      | 1.022  |              |             |                |                  |                  |        | 0.131          | 0.595          |
| TOTAL<br>CREDITS:<br>B-C        | 5.953  |              |             |                |                  |                  |        |                |                |
| PRESERVATION<br>CREDITS:<br>A-C | 1.313  |              |             |                |                  |                  |        |                |                |
| CREDIT<br>BALANCE               | 4.640  |              |             |                |                  |                  |        |                |                |

NOTE: Copies of the spread sheets that will do the required calculations are available in Excel from the Corps of Engineers.

## Calculations:

- 1) The weighting factor, and temporal correction factor, if appropriate, are inserted into the table.
- 2) Existing, With-and Without-bank scores are calculated by dividing the raw WRAP score by 3 for each variable, which yields a percentage. FOR EXAMPLE, for WU, Existing (A) is  $1.5/3=0.5$ ; Without (C) is  $1.0/3=.333$ ; therefore, the delta A-C  $=0.167$  ( $0.5-.333=0.167$ ). Repeat this procedure for the other variables and calculate the deltas for A-C.
- 3) The difference between Existing and Without (A-C) multiplied by the weighting factor previously calculated yields the Adj Delta ( A-C). The acreage of the polygon multiplied by the sum of the variables for the Adj. Deltas (A-C) yields Preservation Credits that may be released up front. For this example, the Preservation Credits are 1.313 (10 acres x 0.131=1.31 Preservation Credits ).
- 4) The difference between With and Without (B-C) multiplied by the weighting factor previously calculated, and the temporary Correction factor, if appropriate for each variable, yields the Adj Delta (B-C). The acreage of the polygon multiplied by the sum of the variables for the Adj. Deltas (B-C) yields the total number of credits available for the bank. For this example, the number is 5.95 (10 acres x 0.595=5.95).
- 5) The difference between the Total Credits and Preservation Credits ( Credit Balance) equals the credits remaining in the bank to distribute through the credit release schedule. For this example, the number of credits available are 4.64.

**Step 7** Combine the scores from all polygons as calculated from Step 6 in the following table. For this example, we only determined the score for polygon A2. It will be necessary for the banker to similarly calculate individual scores for each wetland polygon or groups of similar polygons and include as in the table.

| SUMMATION OF WETLAND POLYGONS |               |                      |                |
|-------------------------------|---------------|----------------------|----------------|
| POLYGON NO.                   | TOTAL CREDITS | PRESERVATION CREDITS | CREDIT BALANCE |
| A1                            |               |                      |                |
| A2                            | 5.95          | 1.31                 | 4.64           |
| A3                            |               |                      |                |
| A4                            |               |                      |                |
| A6                            |               |                      |                |
| A7                            |               |                      |                |
| A8                            |               |                      |                |
| A9                            |               |                      |                |
| SUM                           |               |                      |                |

**Step 8** The last step is to break down by habitat type the number of credits available for each wetland type. For example, there are X credits available for herbaceous wetlands, and X credits available for forested wetlands. Except under exceptional circumstances, as determined by the MBRT, mitigation will be in-kind. For example, if the impacted wetland is a forested system, only forested wetland credits may be purchased from the bank.

**Step 9 Credit Release Schedule.**

There should be no concrete, precalculated credit schedule, such as 15 percent per year for five years. A conceptual schedule should be submitted in the MBI with the following components:

- Conservation Easement/Property Transfer: Specified number of credits (Preservation Credits).

- **Post Construction:** Specified number of credits available for release as determined by successful completion of construction activities (or initial exotic removal).
- **Monitoring:** Number of credits available for release as determined by success criteria attainment (Year 1, Year 2, Year 3, etc.). These credits cannot be accurately predetermined. The majority of credits should be held back for potential release during the progressive stages of this release schedule component, as it measures the true natural resource restoration as it occurs.

Goals and objectives to meet success are generally described in the variable descriptors in WRAP, and success criteria should quantify these descriptors whenever possible. The success criteria and measures should be designed around applicable WRAP descriptors in order to justify the ecological lift of the WRAP deltas. When possible, an optimally-functioning reference wetland should be selected and used as a model for success.

The Florida MBRT believes that it is appropriate to permit flexibility to develop, with the banker, specific credit release criteria. The team has outlined the general criteria to aid in developing a credit release schedule.

### **Credit Release Example**

Polygon A2 from Creekview Example: Total Credits = 5.95

#### **1) Upfront Credit Release**

Existing-Condition Credits (A) minus Without-Bank credits (C) = 1.313

#### **2) Completion of Construction Credit Release**

Based on immediate increase in WRAP variable scores for (1) backfilling of the ditch and (2) initial nuisance and exotic vegetation eradication in the wetland and adjacent buffer (upland and wetland). Must be documented (this will be baseline conditions).

#### **3) Credit Release based on Success Criteria Monitoring**

Wildlife Utilization Variable: 1.5 (existing cond.) to 2.5 (with bank)

Increased hydroperiod will support forage fish, more aquatic inverts and amphibians.

Hydrological monitoring must measure and substantiate increases in hydroperiod.

Wildlife surveys must substantiate increases in specific wildlife guilds (refer to WRAP Addendum: Florida Wildlife Guilds)

Adjacent upland pasture will be restored to upland forest.

Vegetative monitoring must substantiate increases in cover, habitat, and food sources for wildlife in adjacent uplands (as well as the wetland).

Wildlife surveys must substantiate an expansion of the food chain and an increase in wetland wildlife utilization due to adjacent upland influences.

Vegetative Overstory Variable: Not applicable in this wetland.

Vegetative Ground Cover Variable: 1.5 (existing cond.) to 2.5 (with bank)

Vegetative monitoring must substantiate reductions in undesirable species. To fulfill success criteria, there must be less than 10% nuisance and inappropriate plant species and no exotic plant species. This nuisance and exotic success criteria may have been already met and credits released in the construction completion phase.

A decrease in impacts from cattle grazing must be substantiated.

Vegetative coverage in the ditch footprint must be documented.

Adjacent Buffer Variable: 1.0 (existing cond.) to 2.5 (with bank)

Vegetative monitoring must substantiate the successful transition of surrounding upland pasture to quality herbaceous wetland and forested upland, both containing less than 10% nuisance and no exotic plant species.

Wetland Hydrology Variable: 1.5 (existing cond.) to 3.0 (with bank)

Documentation of removal of physical features or conditions impairing hydrologic function. This activity normally would justify credit release in the construction completion phase.

Hydrologic measurements must substantiate a transition to natural hydroperiod. This includes documentation of beneficial increases (or decreases) in water depth, duration (hydroperiod), and frequency (hydropattern) when applicable. Surface water flow pattern documentation should be provided.

Vegetative monitoring must substantiate any transition to a healthy plant community with no stress resulting from an improper hydroperiod.

Water Quality Variable: 1.25 (existing cond.) to 3.0 (with bank)

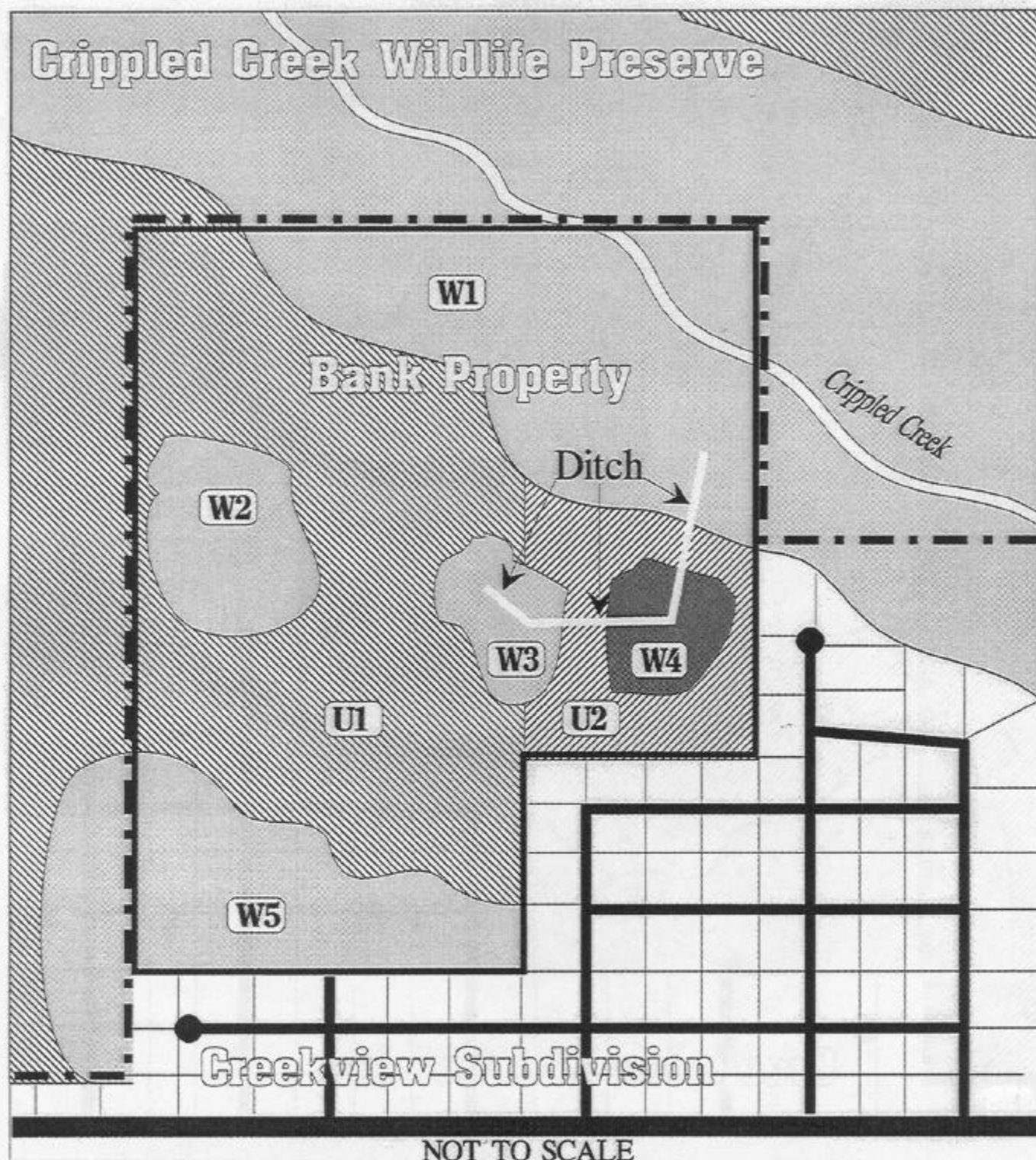
Vegetative monitoring must substantiate the Land Use Category transition from rangeland to natural systems (and subsequently Pre-treatment Category change).



Hydrological documentation must support Pre-treatment Category inputs.

Water quality sampling and analysis is required for baseline documentation. Analysis must substantiate water quality improvement as implied by WRAP input and treatment category changes in order for credits to be released. Refer to WRAP Addendum: Water Quality Indicators.

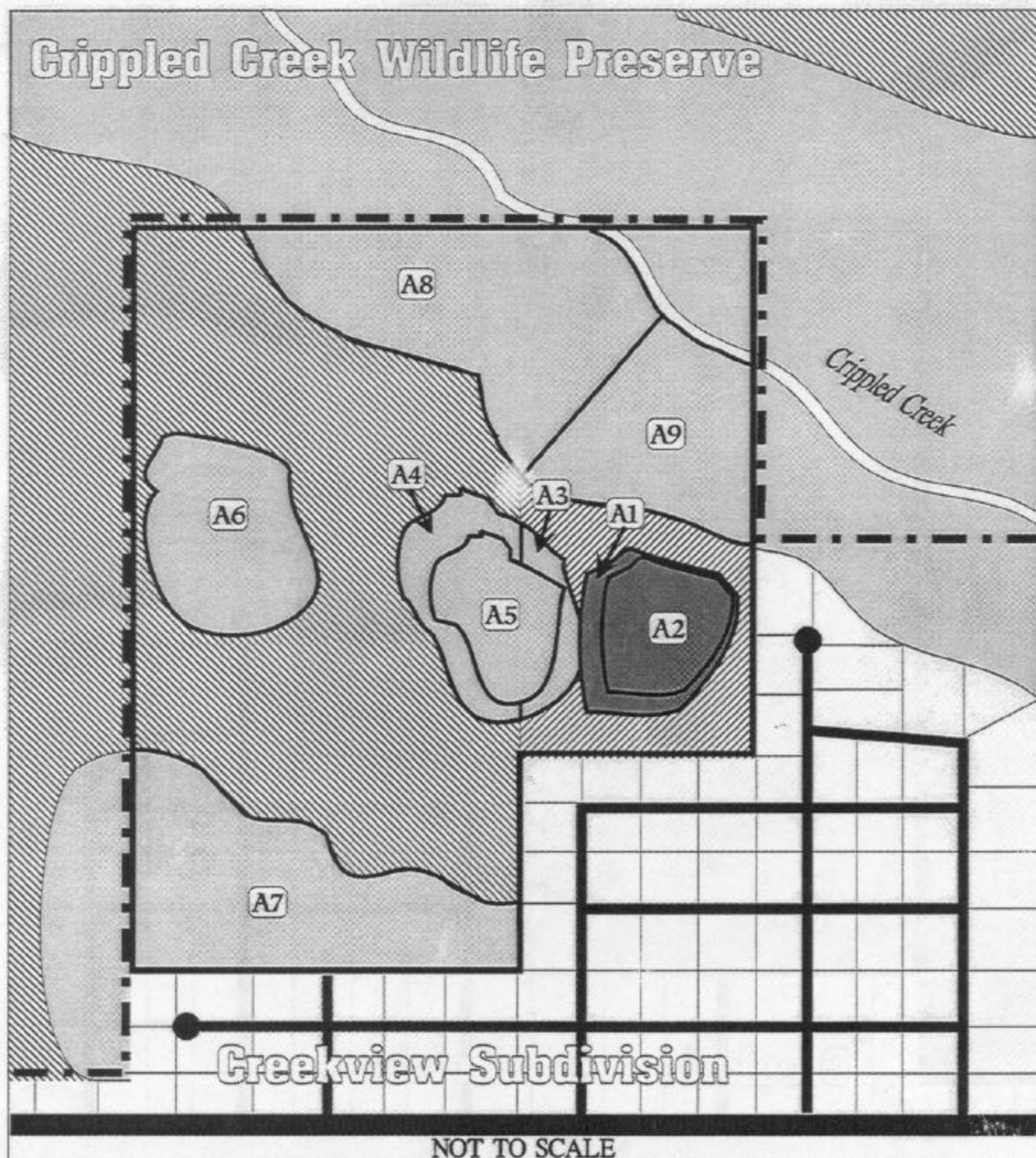
# Crippled Creek Wildlife Preserve



- |                    |                       |
|--------------------|-----------------------|
| Bank Property Line | Preserve Boundary     |
| Forested Wetland   | Forested Upland       |
| Herbaceous Wetland | Upland Pasture        |
| Residential Lot    | Wetland/Upland Number |

Existing Conditions

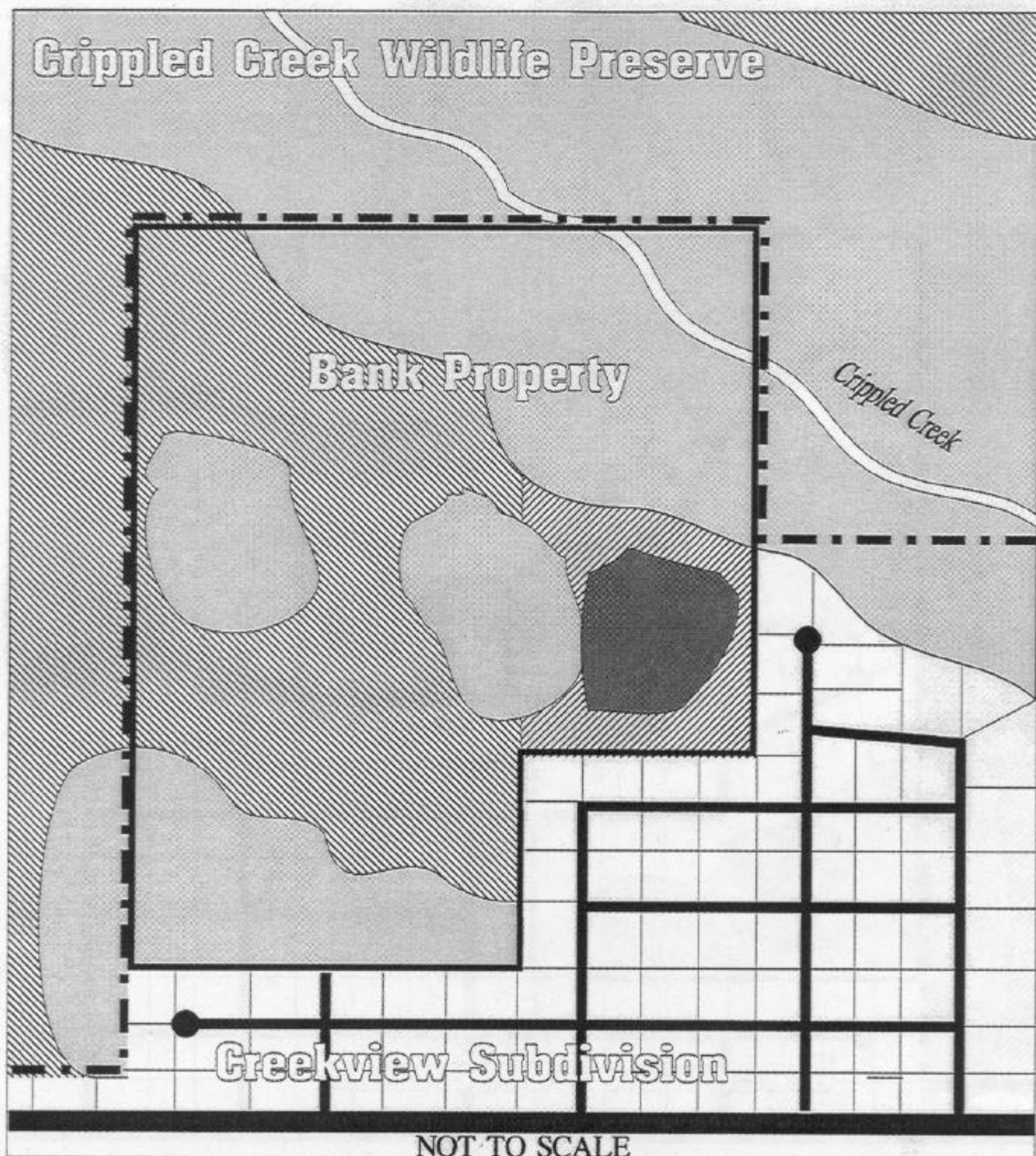
# Crippled Creek Wildlife Preserve



- |                      |                         |
|----------------------|-------------------------|
| — Bank Property Line | - - - Preserve Boundary |
| Forested Wetland     | Forested Upland         |
| Herbaceous Wetland   | Reforested Upland       |
| Residential Lot      | A1 Polygon Number       |

Polygon Delineation

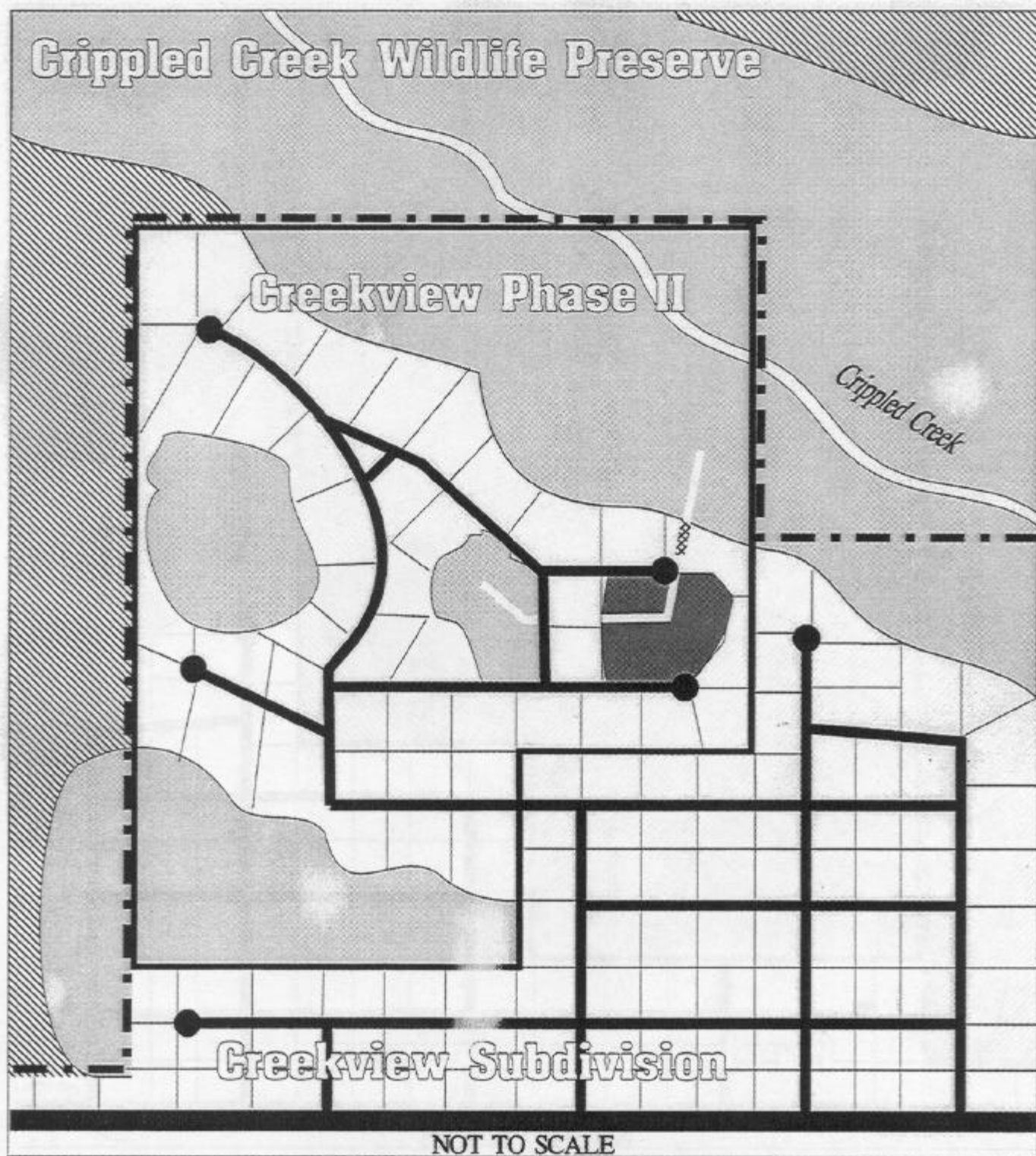




- |                      |                         |
|----------------------|-------------------------|
| — Bank Property Line | - - - Preserve Boundary |
| □ Forested Wetland   | ▨ Forested Upland       |
| ■ Herbaceous Wetland | ▩ Reforested Upland     |
| □ Residential Lot    |                         |

With Bank

# Crippled Creek Wildlife Preserve



NOT TO SCALE

- |                      |                         |
|----------------------|-------------------------|
| — Bank Property Line | - - - Preserve Boundary |
| Forested Wetland     | Forested Upland         |
| Herbaceous Wetland   | Residential Lot         |

Without Bank